

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application.

1. (Amended) A stroking ball-type constant velocity joint comprising:
an inner joint member having a longitudinal axis centered with respect to said inner joint member and an outer surface defining a plurality of radially outwardly facing substantially longitudinal grooves in combination with a plurality of radially outwardly facing substantially helical grooves, said plurality of longitudinal grooves including at least one pair of substantially straight grooves extending substantially in parallel with said inner joint member longitudinal axis, said grooves of each said pair of longitudinal grooves being located on opposite sides of said inner joint member longitudinal axis, said plurality of helical grooves including at least one pair of right-hand twist grooves and at least one pair of left-hand twist grooves, the grooves of each said pair of right-hand twist grooves being located on opposite sides of said inner joint member longitudinal axis, the grooves of each said pair of left-hand twist grooves being located on opposite sides of said inner joint member longitudinal axis; wherein each helical groove is disposed in mirrored rotational relation with a corresponding helical groove disposed on an opposite side of said longitudinal axis wherein said plurality of radially outwardly facing grooves include at least three groove pairs extending in a different rotational directions with respect to one another along said outer surface, wherein said at least three groove pairs includes at least one pair of said plurality of radially outwardly facing longitudinal grooves being two straight grooves mirrored from one another about said centered longitudinal axis of said inner joint member and a first pair of said plurality of radially outwardly facing substantially helical grooves being two right hand helical grooves in mirrored rotational relation to each other about said centered longitudinal axis of said inner joint member and a second pair of said plurality of radially outwardly facing substantially helical grooves being two left hand helical grooves in mirrored rotational relation to each other about said centered longitudinal axis of said inner joint member.
an outer joint member having an inner surface disposed about said inner joint member outer surface, said outer joint member inner surface having a plurality of radially inwardly facing grooves defined in said inner surface; and

a plurality of balls disposed between said inner and outer joint members, a said ball disposed in each said inner joint member radially outwardly facing groove and in a corresponding one of said outer joint member radially inwardly facing grooves, torque transmission between said inner and outer joint members being through said balls.

2. (Amended) The stroking ball-type constant velocity joint of claim 1 wherein ~~each of said plurality of radially outwardly facing grooves extends in mirrored relation to at least one other groove.~~ said outer joint member has a longitudinal axis centered with respect to said outer joint member and said plurality of radially inwardly facing grooves includes a plurality of inwardly facing substantially longitudinal grooves in combination with a plurality of radially inwardly facing substantially helical grooves, said plurality of inwardly facing longitudinal grooves including at least one pair of substantially straight grooves extending substantially in parallel with said outer joint member longitudinal axis, said grooves of each said pair of radially inwardly facing longitudinal grooves being located on opposite sides of said outer joint member longitudinal axis, said plurality of radially inwardly facing helical grooves including at least one pair of right-hand twist grooves and at least one pair of left-hand twist grooves, the grooves of each said pair of radially inwardly facing right-hand twist grooves being located on opposite sides of said outer joint member longitudinal axis, the grooves of each said pair of radially inwardly facing left-hand twist grooves being located on opposite sides of said outer joint member longitudinal axis; and
wherein each said pair of radially outwardly facing longitudinal grooves is engaged with a said pair of radially inwardly facing longitudinal grooves through a pair of said balls.

3. (Canceled)

4. (Amended) The stroking ball-type constant velocity joint of claim 1, wherein each of said substantially helical grooves ~~extends~~ is located between two of said substantially longitudinal grooves.

5. (Original) The stroking ball-type constant velocity joint of claim 1 wherein said substantially helical grooves and said substantially longitudinal grooves are disposed in alternating relation along said outer surface of said inner joint member.

6. (Canceled)

7. (Canceled)

8. (Amended) The stroking ball-type constant velocity joint of claim 1, wherein a first helical groove ~~extends~~ is located between second and third helical grooves, said second and third helical grooves extending in an opposite rotational ~~relation~~ direction relative to said first helical groove.

9. (Original) The stroking ball-type constant velocity joint of claim 1 wherein said plurality of radially outwardly facing grooves includes eight grooves.

10. (Amended) A stroking ball-type constant velocity joint comprising:
an inner joint member having a longitudinal axis centered with respect to said inner joint member and an outer surface defining a plurality of radially outwardly facing longitudinal grooves in combination with a plurality of radially outwardly facing substantially helical grooves, wherein each said helical groove curves in the same rotational direction as a ~~is disposed in mirrored rotational relation with a~~ corresponding helical groove disposed on an opposite side of said longitudinal axis does, said plurality of radially outwardly facing substantially helical grooves including a pair of right-hand grooves and a pair of left-hand grooves; and

a plurality of balls individually disposed in and movable along said plurality of radially outwardly facing substantially helical grooves; and

an outer joint member having an inner surface defining a plurality of radially inwardly facing substantially helical grooves wherein said plurality of radially outwardly facing substantially helical grooves of said inner joint member cooperate with said plurality of radially inwardly facing substantially helical grooves of said outer joint member forming a plurality of passages guiding movement of said plurality of balls and

wherein said plurality of balls transmit torque between said inner joint member and said outer joint member.

11. (Amended) The stroking ball-type constant velocity joint of claim 10, wherein said inner joint member includes a first end and a second end, and said grooves of said plurality of radially outwardly facing grooves extend from said first end to said second end and include four substantially longitudinal grooves disposed located along said outer surface at ninety degrees from one another and four substantially helical grooves individually disposed located along said outer surface and between two of said four substantially longitudinal grooves, and wherein each of said substantially helical grooves extends in an opposite rotational direction relation relative to the rotational direction in which the two adjacent helical grooves adjacent thereto extend.

12. (Amended) A stroking ball-type constant velocity joint comprising:
an inner joint member having a longitudinal axis centered with respect to said inner joint member and a first end and a second end and an outer surface defining a plurality of radially outwardly facing grooves extending from said first end to said second end including four substantially longitudinal grooves disposed along said outer surface ninety degrees from one another and four substantially helical grooves, each helical groove individually disposed along said outer surface between two of said four substantially longitudinal grooves, two of said helical grooves extending in a right-hand rotational direction and disposed on an opposite side sides of said longitudinal axis, two of said helical grooves extending in a left-hand rotational direction and disposed on opposite sides of said longitudinal axis;

a plurality of balls individually disposed in and movable along said plurality of radially outwardly facing grooves;

a cage surrounding said inner joint member and defining a plurality of windows wherein each of said plurality of balls is individually disposed in pierces one of said plurality of windows, said plurality of windows including short windows adjacent said substantially longitudinal grooves and long windows adjacent said substantially helical grooves; and

an outer joint member surrounding said cage and having a third end and a fourth end and an inner surface defining a plurality of radially inwardly facing grooves

extending from said third end to said fourth end including four substantially longitudinal grooves disposed along said inner surface ninety degrees from one another and four substantially helical grooves individually disposed along said inner surface between two of said four substantially longitudinal grooves and wherein said plurality of outwardly facing grooves of said inner joint member cooperate with said plurality of inwardly facing grooves of said outer joint member forming a plurality of passages guiding movement of said plurality of balls.

13. (Original) The stroking ball-type constant velocity joint of claim 12 wherein said substantially helical grooves and said substantially longitudinal grooves are disposed in alternating relation along said outer surface of said inner joint member.

14. (Original) The stroking ball-type constant velocity joint of claim 12 wherein each of said helical grooves of said inner joint member and each of said helical grooves of said outer joint member extends in opposite relation to two adjacent helical grooves.

15. (Amended) The stroking ball-type constant velocity joint of claim 12, wherein at least one of said plurality of passages is defined by a first helical groove of said inner joint member and a second helical groove of said outer joint member, and wherein said first and second helical grooves extend in opposite rotational directions relative ~~relation~~ to one another.

16. (Previously Presented) The stroking ball-type constant velocity joint of claim 9 wherein said inner joint member is further defined as having four longitudinal grooves spaced substantially ninety degrees apart from one another about said centered longitudinal axis.

17. (Previously Presented) The stroking ball-type constant velocity joint of claim 16 wherein said plurality of radially outwardly facing substantially helical grooves is further defined as including two right-hand helical grooves spaced substantially one hundred and eighty degrees apart from one another about said centered longitudinal axis.

18. (Previously Presented) The stroking ball-type constant velocity joint of claim 17 wherein said plurality of radially outwardly facing substantially helical grooves is further defined as including two left-hand helical grooves spaced substantially one hundred and eighty degrees apart from one another about said centered longitudinal axis.

19. (Previously Presented) The stroking ball-type constant velocity joint of claim 18 wherein each of said two left-hand helical grooves is spaced substantially ninety degrees apart from each of said two right-hand grooves about said centered longitudinal axis.

20. (Previously Presented) The stroking ball-type constant velocity joint of claim 1 wherein said plurality of radially outwardly facing substantially helical grooves is further defined as including the same number of left-hand grooves and right-hand grooves.

21. (Amended) The stroking ball-type constant velocity joint of claim 10 further comprising:

a cage surrounding said inner joint member and defining a plurality of windows wherein each of said plurality of balls individually ~~pierces~~ is disposed in one of said plurality of windows, said plurality of windows including short windows adjacent said substantially longitudinal grooves and long windows adjacent said substantially helical grooves.

22. (New) The stroking ball-type constant velocity joint of claim 2, wherein a said pair of radially outwardly facing right-hand twist grooves are engaged with a said pair of radially inwardly facing left-hand twist grooves through a pair of said balls, and a said pair of radially outwardly facing left-hand twist grooves are engaged with a said pair of radially inwardly facing right-hand twist grooves through a pair of said balls.